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SONAR TEST AND TEST INSTRUMENTATION SUPPORT. (U)  
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## I. INTRODUCTION

Applied Research Laboratories, The University of Texas at Austin (ARL:UT), was awarded Contract N00140-76-C-6487, sponsored by New London Laboratory, Naval Underwater Systems Center (NLONLAB NUSC), effective 1 June 1976. Some of the work under this contract represents a follow-on effort to previous work sponsored by NLONLAB NUSC under Contract N00140-74-C-6316.

The work under Contract N00140-76-C-6487 was originally divided into six task areas that focused on technical support in areas of sonar technology:

- I. AN/FQM-10(V) Sonar Test Set Field Support
- II. Transducer Repair Facility Test Site Field Support
- III. AN/WQM-5 Sonar Test Set Field Support
- IV. Special Purpose Passive Sonar Systems Support
- V. Sonar Instrumentation Test and Evaluation
- VI. Study of Towed Line Array Acoustical Testing at Transducer Repair Facilities

Additional tasks were added by contract modifications, as follows:

- VII. AN/SQM-( ) Sonar Noise Measuring Set Development (Mod P00019)
- VIII. AN/WQM-5( ) Sonar Test Set Development (P00019)
- IX. Sonar Dome Maintenance Documentation Support (P00019)
- X. AN/BQQ-5 Power Supply Development (P00019) (follow-on work under Contracts N00024-77-C-6035 and N00123-79-C-0459)
- XI. AN/BQQ-6 Test Instrumentation (P00035)
- XII. AN/WLR-12 Calibration (P00033)

This report is Quarterly Progress Report No. 12 under Contract N00140-76-C-6487, for the period 1 March - 31 May 1979.

## II. TRF, AN/FQM-10(V), and AN/WQM-5 FIELD SUPPORT

### A. TRF Support

ARL:UT provides material and technical support for the Transducer Repair Facilities (TRFs) at three Naval shipyards: Portsmouth (PTSMH), Mare Island (MARE), and Pearl Harbor (PEARL).

During this report period, ARL:UT has provided support for the TRFs as described in the following subsections.

#### 1. MX-9818/GQM-1 Adapter, Filling Fixture, Transducer

The third of three filling fixtures is now completed and is scheduled for shipment to NAVSHIPYD PEARL in June 1979.

#### 2. NAVSHIPYD PTSMH Pressure Vessels

The 3000 psi and 1000 psi pressure vessels for PTSMH, along with their associated hardware and operator's console, were stored at ARL:UT for approximately four years, awaiting completion of the new TRF building in which they will be installed. When NAVSEA ordered the delivery of these pressure vessels, several of the components were found to have been damaged due to nonuse. Items such as pumps, valves, air and water lines, and valve actuators were refurbished by ARL:UT to "like new" condition. The pressure vessels were sandblasted and primed as needed. They were not painted because it was felt that the paint would be marred in transit. Instead, it was decided, with PTSMH's concurrence, to provide the paint to the shipyard for final painting.

ARL:UT shipped both vessels and the majority of the hardware on 7 March. Another shipment will soon follow which will include paint, the cable entry stuffing tubes, and the remainder of the associated hardware.

3. Jib Crane/Hoist Systems for YFNX 1250 and Fixed Positioners

Work on the jib crane/hoist systems and fixed positioners proceeded according to schedule and was completed during March. On 1 April, follow-on work on these projects began under Contract N00024-79-C-6358 and further progress will be reported under that contract.

4. Repair Fixture for AN/UQN-1,4 Transducer

During March and early April, the six units of the repair fixture were assembled to ensure proper fit. They were then disassembled, sandblasted, primed, painted, reassembled (Fig. 1), and tested. The repair fixtures were packed two to a crate for shipment to the TRFs. Four repair fixtures were shipped, two to NAVSHIPYD PTSMH and two to NAVSHIPYD MARE, in late April. It is planned that the two units for NAVSHIPYD PEARL will be shipped in June 1979.

B. AN/FQM-10(V) Sonar Test Set Field Support

ARL:UT also provides material and technical support for six AN/FQM-10(V) sonar test sets located at the TRFs at NAVSHIPYDs PTSMH, MARE, and PEARL. In addition, ARL:UT maintains a pilot AN/FQM-10(V) at its Lake Travis Test Station (LTTS). During this report period, ARL:UT has provided support for the test sets as described in the following subsections.

1. NAVSHIPYD PTSMH Test Sets

ARL:UT repaired, calibrated, and returned two units of the AN/FQM-10(V):

- (1) frequency tracking servo model No. 1114A, unit 4
- (2) sampling digital voltmeter model No. 1166, unit 74.



**FIGURE 1**  
**ADAPTOR, FILLING FIXTURE, TRANSDUCER, MX-9818/GQM-1**  
**REPAIR FIXTURE FOR AN/UQN-1, 4 TRANSDUCERS**

2. NAVSHIPYD PEARL Test Sets

ARL:UT repaired, calibrated, and returned the sampling digital voltmeter model No. 1166, unit 74.

The above listed activities concluded ARL:UT's efforts toward AN/FQM-10(V) field support under Contract N00140-76-C-6487.

C. AN/WQM-5 Sonar Test Set Field Support

ARL:UT provides field maintenance engineering support for the 27 AN/WQM-5 sonar test sets located at various naval shipyards, laboratories, and support activities. During this report period, ARL:UT has provided support for AN/WQM-5 test sets as described in the following subsections.

1. AN/WQM-5, Ser B1

Upon request, ARL:UT sent one each 1A7, 1A6, 1A35, and printed circuit boards to MOTU 4 at Groton, CT. These boards were installed in the readout monitor unit and the test set was reported to be operating properly.

2. AN/WQM-5, Ser A7

The pulsed signal generator, unit 3, from the test set located at NAVSHIPYD LBEACH was repaired and calibrated at ARL:UT and then returned to its custodian at Long Beach.

3. AN/WQM-5, Ser A14

A capacitor box, unit 9, of the test set at NAVSHIPYD PTSMH failed and was sent to ARL:UT for repair. ARL:UT sent NAVSHIPYD PTSMH a unit on loan. The failed capacitor unit was repaired and returned to Portsmouth.

III. SPECIAL PURPOSE PASSIVE SONAR SYSTEMS SUPPORT

No work was performed on this task during the report period.

#### IV. SONAR INSTRUMENTATION TEST AND EVALUATION

Work under this task presently includes conceptual design of a family of calculator-based sonar test sets. The following paragraph describes work on the AN/GQM-( ) immittance test set.

The official nomenclature for the immittance test set, AN/GQM-2 Transducer Test Set, was received in May. The first V/I sampling unit was tested satisfactorily in March, using a network analyzer and synthesizer borrowed from another project at ARL:UT. Final assembly of the remaining units was begun. Development of software to operate the test set progressed although a complete system was not available full time. The synthesizers and network analyzers were received from Hewlett-Packard in late May, and assembly of the complete test sets began immediately.

V. DOCUMENTATION SUPPORT (SONAR DOME HANDBOOKS)

On 20 March the information needed for further revision of "Sonar Dome Handbook, Volume III, AN/SQS-38 GRP Sonar Domes" was received from NAVSECNORDIV, and on 11 April a package of photographs for illustrations was received from the Commandant, U.S. Coast Guard. This material was processed, and review copies of the revised handbook were sent to NAVSECNORDIV and to the Commandant, U.S. Coast Guard, on 4 May. It appears that some additional photographs are needed for illustrations. The staff of Commandant, U.S. Coast Guard, advised that these photographs would not be available until the next Coast Guard cutter is drydocked for sonar maintenance, which will be September 1979.

Funds for work on this task under Contract N00140-76-C-6487 were expended during this report period. Documentation support will continue under Contract N00024-79-C-6358.

## VI. AN/WQM-5( ) PROCUREMENT AND FIELD CHANGE PROGRAM

By 31 May, ARL:UT had received from C-Tech, Inc., the following AN/WQM-5( ) Field Change Kits.

AN/WQM-5	-- 10
AN/WQM-5B/C	-- 8

Two AN/WQM-5B/C kits and three sets of spares remain to be delivered by C-Tech, Inc. These materials are being installed as a part of the retrofit/repair program begun under Contract N00024-79-C-6358. Thus far, eleven AN/WQM-5( ) sets have been retrofitted and redelivered to user activities.

## VII. PIERSIDE CALIBRATION OF AN/WLR-12

The final report on this task, "Feasibility Study for Pierside Calibration of the AN/WLR-12 Sonar Receiving Set" (U), Applied Research Laboratories Technical Report No. 79-25 (ARL-TR-79-25), 5 April 1979, was distributed during this report period. All work on this task has been completed and all funds expended.

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